9 External Auditory Canal

- Exostosis and Osteoma

Exostoses are defined as new bony growths in the osseous portion of the external auditory canal. They usually appear as multiple, bilateral, and broad-based masses (Fig. 9.1). They vary in shape, being round, ovoid, or oblong. The condition may be caused by periostitis secondary to exposure to cold water. This explains the high incidence of exostoses among divers and those who engage in cold-water sports activities.

Osteomas are true benign neoplasms of the bone of the external auditory canal, and are usually unilateral and pedunculate (Fig. 9.2). They often arise along the tympanomastoid or tympanosquamous suture line.

Histologically, exostoses are formed from parallel layers of newly formed bone. It is postulated that the periosteum stimulates an osteogenic reaction with each exposure to cold water, thus causing this stratification. Osteomas are differentiated by the absence of the laminated growth pattern. However, their histological appearance may not be so clearly distinguishable, even though these two lesions are clinically different entities.

These lesions are usually asymptomatic. However, they may grow large enough to occlude the external auditory canal, leading to conductive hearing loss or retention of wax and debris medially with subsequent otitis externa. Eventually, cholesteatoma of the external auditory canal may arise. Surgery is conducted in exostoses and osteomas with obstructing stenosis (with or without hearing loss), or with frequent otitis externa where it is necessary to fit a hearing aid. In cases where symptoms are minimal, it is useful to photograph the ear for further follow-up.

In surgery, preservation and proper replacement of the meatal skin is important to prevent postoperative scarring and stenosis. Osteoma can be removed using a curette. However, if osteoma recurs, wide drilling of the bone around its base is indicated.

- Surgical Steps

1. In limited cases in which wide exposure is not required (Fig. 9.3), such as small osteoma, the transcanal approach may be used. In the transcanal approach, meatal skin is incised through an ear speculum and the skin over the osteoma is elevated. The osteoma is removed with either a curette or a burr (Figs. 9.4, 9.5, 9.6).

2. Retroauricular incision is used in most cases since this approach is wider and safer than the transcanal approach. The initial steps of surgery including skin incision, harvesting the temporalis fascia, and soft tissue incision are conducted as described earlier (see Chapter 7).

3. If the pathology is not very severe and the tympanic membrane is visible, flap elevation and drilling of the canal is conducted in the same manner as canalplasty (see Chapter 7).

4. With severe exostosis, there is no consistent landmark in the external auditory canal since the tympanic membrane is
Fig. 9.2 a, b  Osteomas.

Fig. 9.3  Limited osteoma.

Fig. 9.4  Using a curette for removal of a small osteoma through a transcanal approach.
obscured (Fig. 9.7). If there is any space medially, the skin is detached from the bone and pushed medially toward the tympanic membrane. The skin may be protected with an aluminum sheet with or without a small piece of Cottonoid beneath the sheet.

5. If the space medial to bony protrusions is insufficient to contain the detached skin, the skin covering the bony overhang is detached and folded toward the contralateral wall. Part of the protrusion is drilled medially while the skin is protected with an aluminum sheet (Fig. 9.8).

6. The meatal skin covering another protrusion is detached, and the flap is then folded toward the space created by the drilling. The aluminum sheet is repositioned between the bony wall and the meatal skin flap, and the bony protrusion is partially drilled medially.

7. After partly drilling the second bony protrusion, the meatal skin is repositioned, and the first protrusion is drilled further. In this way, the canal is gradually drilled from lateral to medial.
8. The mastoid segment of the facial nerve runs in the vicinity of the posterior meatal wall, 2–3 mm posterior to the annulus. The reported incidence of iatrogenic injury to the facial nerve during surgery for exostosis is very high. To avoid injury, it is important to restrict the area of drilling around the meatal skin until the tympanic membrane can be seen adequately. The position of the tympanic membrane should be verified from time to time by replacing the meatal skin.

9. If the protrusion still limits the view of the tympanic membrane, the anterior canal wall may be drilled to help visualize the membrane, taking care not to damage the temporomandibular joint anteriorly (Fig. 9.9). However, accidental exposure of the temporomandibular joint is preferable to damage of the facial nerve. For this reason, the medial part of the posterior canal wall should not be drilled before identification of the facial nerve or at least its landmarks.

10. Using the meatal skin elevator (#2), the amount of bone to be removed and the distance from the annulus are estimated from time to time.

11. Removal of the final bony overhang may be made using a small curette (Fig. 9.10). If the drill is used, care should be taken not to touch the short process of the malleus with a burr. (See Chapter 7, p. 78.)

12. Exposed mastoid air cells are managed in the same manner as in canalplasty. The exposed canal bone should be covered with the temporalis fascia. Longitudinal plastic cuts may be made in the meatal flap to ensure intimate lining of the bone. Lateral meatal skin may also be cut longitudinally.

13. Finally, the external ear canal is packed with Gelfoam.
Case 9.1 (left ear)

Fig. 9.1-1 In performing surgery for exostosis, the retroauricular approach is strongly recommended since it gives a much better exposure of the external auditory canal. The canal is severely narrowed by exostosis. Two osteomatous protrusions are seen in the superior and posterior walls.

Fig. 9.1-2 The skin covering the exostosis is carefully removed to preserve its integrity as much as possible. The two prominent exostoses on the posterosuperior wall are exposed.

Fig. 9.1-3 Both protrusions are removed easily with a curette.
Fig. 9.1-4 The meatal skin flap is then reflected posteriorly, and detached from the bony protrusions in the anterior and inferior walls.

Fig. 9.1-5 The skin is then pushed medially to the protrusions to make some room for drilling. To save time, most of the bone work is carried out with cutting burs.

Fig. 9.1-6 To avoid damaging the skin flap, it should be well protected with an aluminum sheet of adequate size.
Fig. 9.1-7  The most lateral parts of the protrusions are removed.

Fig. 9.1-8  The position of the aluminum sheet is changed medially, and the lateral part of the bone is further removed.

Fig. 9.1-9  The result of drilling is shown. Note the narrow space between two protrusions.
Fig. 9.1-10 The aluminum sheet is moved medially to further remove the bone.

Fig. 9.1-11 As a result of drilling, undetached skin covering the medial face of the protrusion approaches the area to be drilled.

Fig. 9.1-12 The bone overhanging the edge is removed with a curette.
Fig. 9.1-13 The skin is further detached medially with a microdissector.

Fig. 9.1-14 After sufficiently detaching the skin from the medial face of the protrusion, the drilling is advanced medially with a smaller cutting burr. Protection of the flap with aluminum sheeting is very important.

Fig. 9.1-15 The canalplasty has reached the area of the tympanic membrane. Some bony overhang remains near the tympanic membrane. The final bony overhang can be removed with a small diamond burr and a curette. Great care should be taken not to touch the lateral process of the malleus during drilling of the anterosuperior wall.
Fig. 9.1-16 The final shape of the bony meatus is shown. The entire meatal skin is reflected posteriorly.

Fig. 9.1-17 The meatal skin is replaced over the bony wall. Note that the skin is well preserved and the tympanic membrane remains intact.

Case 9.2 (left ear)

Fig. 9.2-1 The posterior meatal skin has been cut just lateral to the exostosis. Note the narrowing of the canal. The anterior meatal skin is cut to complete circumferential incision.